ACE 2 COMMODORE64•COMMODOREPLUS4•SPECTRUM&AMSTRAD
FULL INSTRUCTIONS

LOADING 'ACE 2'
(1) BEFORE YOU START
Remove all unnecessary peripherals (printer, cartridges etc) as they will interfere with the program. If you are using joysticks with an AUTO-FIRE Option, these must be set of OFF. Turn your computer ON. Commodore 128 users must hold down the COMMODORE KEY as they do so. If you are using cassette, ensure that the tape unit is placed some distance from the TV/Monitor, and that the tape heads are cleaned regularly.

(2) COMMODORE 64/128 CASSETTE
Hold down SHIFT, and press RUN/STOP. Press PLAY on the cassette unit. ACE 2 will load after a few minutes.

(3) COMMODORE PLUS/4 CASSETTE
Type 'LOAD' and press 'RETURN'. Press PLAY on the cassette unit, and the game will be loaded after a few minutes.

(4) COMMODORE 64/128/PLUS 4 DISK
Type 'LOAD"*",8,1' and press RETURN. The game will be loaded after a few minutes. KEEP THE DISK IN THE DRIVE DURING THE GAME.

OVERVIEW OF 'ACE 2'
AIR COMBAT EMULATOR TWO (ACE 2) is a head to head flight and combat simulation for one or two players, each flying a different type of fighter. Plane One is a carrier based aircraft, whilst Plane stationed at an airbase. In the single player mode, the human controls Plane One, and the computer flies Plane Two, using very advanced artificial intelligence to execute both offensive and defensive manoeuvres. Plane Two is from a desert country, with western coast line. Plane One is based on a foreign aircraft carrier, which is positioned out of territorial waters.

ACE 2 is really two games:-

(1) CLOSE RANGE DOGFIGHT
Both aircraft are armed with aerial cannon, and with close-range heat-seeking missiles. They are placed at a random map position, but fairly close to each other. The planes must fight each other using the available weapons, and if one aircraft is shot down, the game continues, both pilots receiving a fresh plane. The game ends when one of the pilots has no more aircraft left.

(2) FULL-SCALE AERIAL AND GROUND ATTACK
The country of Plane One has positioned a Spyship, close to the coast of its rival, whose mission is to monitor an inshore radar station. Contrary to all expectations, the inhabitants have reacted aggressively to this action, and have sent a single plane, from an airbase to the east of the radar station, to destroy any enemy aircraft, and sink the enemy vessel. Help is summoned, and a single, carrier based fighter is sent, with orders to shoot down the attacker, and then to destroy the aforementioned radar station. Each aircraft has an aerial cannon, and can be further armed with a variety of short and long range air-air missiles, and an air-ground missile. The pilots must choose the weapon load; the section ARMING THE AIRCRAFT explains this fully.

SETTING THE OPTIONS FOR 'ACE 2'
Use either joystick to move the arrow up and down, and press fire to change an option.

(1) COMMENCE CONFLICT
Move the arrow to the top, and press fire when you are satisfied with the options.

(2) COMBATANTS
Set for One Player, or Two Players.

(3) COMPUTER OPPONENT SKILL LEVEL
Only switchable if playing against the computer. Changing this value (1-20) will increase the skill and ability of the computer pilot.

(4) COMBAT SCENARIO
Change this, to obtain the type of game that you wish to play, either CLOSE RANGE DOGFIGHT or FULL SCALE CONFLICT (see above).

(5) NUMBER OF PLANES EACH
Effectively, this is the number of 'lives' allowed, and is normally set to 3, but can be increased to a maximum of 20, to give a really long game!

(6) CRASH DETECTION
Normally set to ON, this can be turned OFF, and when either plane crashes into the sea or the ground, the aircraft is not destroyed. Recommended for new pilots!

(7) NUMBER OF MISSILE HITS REQUIRED TO KILL
This normally set to 3, but can be reduced, to give a more realistic representation of the destructive power of modern weapons!

(8) SAVE THESE OPTIONS TO DISK (DISK BASED GAME ONLY)
Use this to save the current options to the disk, so that when the game is next loaded, they are automatically selected.

ARMING THE AIRCRAFT (ONLY NECESSARY DURING THE FULL-SCALE CONFLICT GAME)
When you see the picture of your aircraft, move the arrow down, to select 'ARM', and the arming menu will appear. Move the arrow to a weapon name, and press fire to increase the number that will be carried. The program will ensure that the weapon load selected is in the carrying capacity of the aircraft:-

CANNON - 3000 rounds (fixed)
HEAT SEEKING MISSILES - maximum of 8, but less if other weapons carried.
RADAR-GUIDED MISSILES - maximum of 6, but none may be carried if any air-ground/air-ship weapons are carried.
AIR-GROUND/AIR-SHIP MISSILES - maximum of 2.

FLYING THE AIRCRAFT IN 'ACE 2'
This part of ACE 2 has been designed as a simulation of flying a Mach 2 combat aircraft, but with many of the complex and difficult aspects of piloting removed. Here are some of the things about which you don't need to worry:-

Undercarriage control
Flaps setting
Rudder Control
Engine Temperature
Decrease in turn rate at very low and very high speed. Keeping below maximum safe speed.
Avoiding maximum g-forces.

The following information applies to flying EITHER aircraft.

(1) ENGINE POWER
Use the two keys specified, to increase or decrease the power of your turbofan jet engine. At more than 75% power (that is, when the thrust bar indicator on your instrument panel is more than three-quarters full), the afterburners are engaged. This drastically increases thrust, but at the price of heavy fuel consumption. Afterburners are needed to fly at speeds above Mach 1.0 (about 760 knots).

(2) USING THE JOYSTICK
Moving the joystick up or down will change the pitch angle of the aircraft. If the plane is flying upside down, pulling the joystick back will cause the aircraft to dive; when the plane is not upside down, the aircraft will climb. Observe your pitch indicator.
In order to turn the plane, it must be put into a bank. Moving the joystick left or right will do this. To turn quickly, put the plane into a steep bank, and pull back on the stick. Note that when the aircraft is in a steep bank, moving the joystick up or down will have little or no effect on the pitch of the plane.

(3) STALLING AND CEILING
Stalling occurs when the speed of the aircraft is not sufficient to keep the aircraft in flight. In a real aircraft, the stall speed varies according to its situation, but in ACE 2 it has been fixed at 140 knots. The ceiling (maximum altitude of the aircraft) is 60000 feet.

(4) HANDS ON THROTTLE AND STICK CONCEPT (HOTAS)
Real aircraft, such as the F-18 Hornet, and the F-15 Eagle, use the HOTAS concept in the design of their flight controls. The most important controls that are needed by the pilot during aerial combat are placed on either the throttle (the lever to control the engine's power), or the joystick. The pilot's left hand is usually on the throttle, his right hand on the stick. The flight controls to ACE 2 have been designed in a similar way; all the controls for Plane One are at the left of the keyboard, and those for Plane Two at the right. We recommend that each player sits to the appropriate side of the computer, with his right hand on the stick, and the fingers of his left hand on, or near the thrust, weapons selection, and defence keys. You may wish to vary this arrangement to suit your own needs.

AIRCRAFT INSTRUMENTATION

NOTE: REFER TO THE ENCLOSED DIAGRAM

PLANE ONE
The instrument panel of Plane One represents the latest type, with the information being presented on cathode ray tubes (CRT's). The bottom of the left CRT shows the name of the current weapon selected, and how many units of that weapon you have:-

CANNON - AERIAL CANNON
HEAT AA - HEAT-SEEKING AIR-AIR MISSILE
RADAR AA - RADAR GUIDED AIR-AIR MISSILE
AIR-GRND - AIR-GROUND MISSILE

At the left of centre CRT is the RADAR SCANNER. The dot in the middle is your aircraft, and radar contacts (missiles, enemy planes etc) to the front of your plane are shown above this dot. The radar automatically adjusts its display, when the target is at close range, and you will notice that the scale lines on the side of the display, will change.
To the right of the radar is the PITCH DISPLAY. This is a representation of the apparent movement of the horizon, as the pitch of the aircraft is changed. Thus, when the aircraft is flying with the nose at pitch zero, the pitch bar which represents the ground, occupies the bottom half of the display. As you increase your pitch, you will see the ground appear to move down, and the pitch bar moves in a similar fashion.
At the right of the centre VDU, is the aircraft roll indicator, which indicates the banking angle of your plane.

PLANE TWO
The instrument panel of Plane Two represents an older design, and features CRT's as well as conventional instruments.
At the extreme left, the weapons selector switch shows the current weapon selected:-

C - CANNON
H - HEAT-SEEKING AIR-AIR MISSILE
R - RADAR GUIDED MISSILE
S - ANTI-SHIP MISSILE

The operation and the meaning of the PITCH BAR, COMPASS, RADAR, DIGITAL READOUTS, POWER AND FUEL BARS, is the name as that of Plane One.

USING THE MAP
The map can be displayed on either player's screen. The black dot is Plane One, and the white dot is Plane Two. The map also shows missiles, the spyship, and the radar station. The aircraft carrier and airbase are NOT on the map; they are situated to the west and east of it.

USING THE AIRCRAFT WEAPONS SYSTEMS IN 'ACE 2'
Both the aircraft are armed with similar weapons and similar capabilities. They have an AERIAL CANNON for very close range work, HEAT-SEEKING AIR-AIR MISSILES for close range, RADAR-GUIDED AIR-AIR WEAPONS for long range shots, and AIR-GROUND (Plane One) or AIR-SHIP (Plane Two) MISSILES.

(1) AERIAL CANNON
Mounted in the port wing roof of each aircraft, this fires cannon shells in a line of the direction of flight of the plane. Use the cannon against the enemy aircraft, when it is less than one mile away. To aim the gun, move the aircraft so that the centre of the gunsight is over the desired target. Try to fire at an aircraft from behind the target. Several cannon hits will be needed to destroy the plane.

(2) AIR-AIR MISSILES
Note: ACE 2 is initially set so that three missile hits are needed to destroy a target, but this can be reduced to two, or even one (see SETTING THE OPTIONS).

(i) HEAT SEEKING AIR-AIR MISSILES THESE ARE SHORT RANGE WEAPONS (RANGE LESS THAN 8 MILES). This is a FIRE AND FORGET WEAPON, which means that once the missile has been fired, the pilot does not need to guide it to its target; he can forget the missile.

Point the nose of your aircraft towards the target plane. You should see a sights box, indicating the position of the target, which will appear as only a dot at extreme range. The message panel will print the target's range and altitude, and will tell you when the sensors in the missile have locked on to the heat source (the enemy plane). The message 'TARGET LOCKED' means it is OK to fire. Once you fire, you have no control or influence over the missile. If the target is close, try some cannon shots.

(ii) RADAR GUIDED AIR-AIR MISSILES THESE ARE LONG RANGE WEAPONS (RANGE LESS THAN 25 MILES). This is a SEMI-ACTIVE RADAR GUIDED MISSILE, which means that the missile must be guided to the target by the radar from your aircraft. As with heat-seeking missiles, the sights box will indicate the target, the panel will say 'TARGET LOCKED', and you may fire. THIS IS WHERE THE USE OF THE MISSILES DIFFERS. Having fired the radar-guided missile, you MUST keep the target aircraft within the sights box, for the whole of the missile's flight (about 30 seconds if the target is 25 miles away).
Should the target 'move' away from the sights box for a few seconds, the radar will be unable to find it, and the missile will be lost. Note that the sights box moves around, so you do not need to point the plane DIRECTLY at the target.

(3) AIR-GROUND/AIR-SHIP MISSILE
The operation of this device is the same, for both Plane One and Plane Two, although the actual missiles are different. Approach the target at below 2000 feet, and at a speed of 500 knots or less. Point your aircraft so that the target is within the sights box, and when the panel says 'TARGET LOCKED', fire the missile. YOU MUST MAINTAIN YOUR AIM ON THE TARGET, whilst the missile flies towards it. As with radar-guided air-air missiles, if the target should 'move' from the sights box for more than a few seconds, the missile will be lost.

SCORING
CANNON HIT ON TARGET AIRCRAFT ..... 20 POINTS
MISSILE HIT ON TARGET AIRCRAFT ..... 50 POINTS
ENEMY AIRCRAFT DESTROYED ..... 200 POINTS
ENEMY GROUND TARGET
DESTROYED ..... 2000 POINTS

DEFENDING YOUR AIRCRAFT
If an enemy missile is fired at you, launch flares or chaff (the game selects the correct one), to decoy the missile. You have 6 flares, and 6 chaff pods. Flares and chaff are most effective when the missile is about 1 mile away; the instrument panel will tell you the range. Either climb or dive to change your altitude by several thousand feet, to avoid the missile.

If an enemy aircraft is behind you, and quite close, either turn sharply, or pull up quickly, to move away from it. If the range is less than a mile, and you cannot get away from it, keep banking, pulling back, then rolling to a different angle, and pushing forward, to avoid the enemy cannon fire.
When attacking a ground target or ship, watch out for enemy surface to air missiles, and take the measures described above, to avoid them.

If you ARE hit, your controls will not respond for a few seconds, during which, you are very vulnerable to another missile, or cannon rire. So if you are being chased by a missile, fly AWAY from the enemy, as you take evasive action.

RETURNING TO BASE
If your fuel or weapons are low, or your plane has been hit several times, return to your base, to be repaired, re-armed and re-fuelled.
PLANE ONE MUST FLY OFF THE WEST SIDE OF THE MAP, AT LESS THAN 1000 FEET, TO RETURN TO THE CARRIER.
PLANE TWO MUST FLY OFF THE EAST SIDE OF THE MAP, AT LESS THAN 1000 FEET, TO RETURN TO ITS AIRBASE.

FLYING A COMBAT MISSION
New pilots are recommended to fly against the computer, at level one, to gain combat experience.
Your aircraft is primarily an air superiority fighter, designed to shoot down the other plane, but also has a secondary air-ground role, employed in the full-scale conflict game. When fighting an aircraft, try to gain height, so that your machine will be faster, and more agile, in the less dense air. Select the weapon that you wish to use, and close to the correct range. YOU WILL FIND YOURSELF DISTRACTED AND MOMENTARILY CONFUSED IF YOU LOOK AT THE OTHER PLAYER'S INSTRUMENT PANEL. DON'T DO IT. Flares and chaff are only partially effective against incoming missiles, so it is best to take evasive action as well. Enemy missiles cannot be shot down.

Remember that your plane can fly faster at higher altitudes (30000 feet or more is ideal). High speed will be needed to reach a distant target, or to escape from the conflict zone, and return to base.
If you are trying to flee, and the enemy is constantly close behind you, try slowing down, then pulling back on your stick until you face him, then firing a heat-seeking missile (it is best to take evasive action, and 'buy' you some distance.
Try to attack the enemy plane from approximately the same altitude (to within 10000 feet).
You CAN collide with the enemy plane, so take care!